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Mr. Gabb made some remarks on a small lot of fossils submitted to him by Prof. Orton. The fossils are small, and all belong to undescribed species. They are of unusual interest, being the first fossils, so far as he was aware, ever found in the immense clay deposits of the Amazon Valley—the Tabatinga Clay. The fossils indicate a marine origin for this clay, all of the genera being essentially salt-water forms. They were found by Prof. Orton in a bluff showing a fine section of about fifty feet in height, at the town of Pebas, on the Amazon River, two miles above where it joins the Marañon.

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July 28th.

DR. J. GIBBONS HUNT in the Chair.

Fifteen members present.

The following gentlemen were elected members: Geo. Roberts, M.D., Mr. Levi Taylor.

The following were elected correspondents: S. Spencer Cobbold, M.D., of London, W. Kitchen Parker, of London, Rev. Samuel Houghton, of Dublin, Alphonse Milne Edwards, of Paris, Wm. T. Brigham, of Boston.

On favorable reports of the committees, the following papers were ordered to be printed:

**MITCHELLA REPENS, L., a dioecious plant.**

BY THOMAS MEEHAN.

A few weeks ago I had the honor of pointing out to the members of the Academy that *Epigæa repens* was a dioecious plant. I have now to report a like discovery in *Mitchella repens*.

In the case of *Epigæa* I had to indicate the polymorphism accompanying the divisions of the sexes, as part of the discovery; in the present instance Dr. Asa Gray is before me in noting the distinct appearances; the originality of my own observation lies merely in giving the meaning of the facts already recorded. In the last (5th) edition of Gray's Manual, speaking of *Mitchella*, the author says, "Flowers occasionally 3—6, merous, always dimorphous, all those of some individuals having exerted stamens and included stigmas,—of others included stamens and exerted style." Although this statement expresses the appearance, it is not strictly accurate; for the pistil in the one case is not perfect, and in the other the anthers are mere rudiments, without a trace of pollen in any that I have examined. The two forms are truly male and female plants.

In the female plant the pistil, with its well-developed stigma, projects one-eighth of an inch beyond the throat of the corolla. The small rudimentary anthers are sessile, and hidden among the coarse down of the corolla tube, so as not to be seen without dissection.

In the male plant it is the rudimentary pistil which is confined in the villous tube, far out of reach of pollen influence, if even it were perfectly developed. On the other hand, the anthers are borne on filaments which are free from the corolla for one-eighth of an inch, and projecting that much beyond the corolla throat.

In the case of *Epigæa* I had to record many variations in the form and proportions of the floral parts. *Mitchella* is as remarkable for uniformity; except that the calyx teeth in the male are coarser than in the female, there is little variation from one type. Dr. Gray observes that the lobes of the corolla

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vary from three to four, five, and six. I may add that five-lobed corollas are common, and these are usually accompanied by five anthers.

The number of male plants is about equal to the female; occasionally plants of the separate sexes intermix. I, and probably others, have often noticed in the fall some patches bearing abundantly, other patches without a berry. The facts I now offer afford the solution.

In reference to *Mitchella*, it may not be out of place to correct an error in Lindley's "Vegetable Kingdom." The learned author includes in his natural order Cinchonaceæ *Mitchella*, *Cephalanthus*, *Diodia*, *Oldenlandia* and *Spermacoce*,—all high northern plants; and yet, when speaking of the geography of the order, writes that "the most northern species in America is *Pinckneya pubens*, inhabiting the Southern States of North America."

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**Second contribution to the History of the Vertebrata of the Miocene period of the United States.**

BY E. D. COPE.

A visit to the Miocene region of the western shore of Maryland, has explained to the writer more clearly the stratigraphical position of the vertebrate fossils described in this and preceding essays on the subject.

The miocene deposit which contains the fossils, consists of a dark sandy clay, varying from a leaden to a blackish color, through which water does not penetrate. Its upper horizon may be traced along the high shores and cliffs of the Chesapeake by the line of trickling springs which follow its upper surface. The bottom I have not seen, and cannot give its depth, but a great bed of shells occurs at from fourteen to twenty-two feet below its upper horizon. This consists of, first, two separate shallow strata of shells, and about four feet below the upper, a heavy bed at the depth mentioned. The lesser beds vary in amount, being sometimes wanting.

The streams of the country either flow on or cut the shell beds, and display their washings, as teeth of sharks, cetaceans, etc. The bones generally occur at or near the level of the upper line of shells. The remains of the large whale, the *Eschrichtius cephalus mihi*, lay across the bed of a small run and penetrate the bank, where I saw the remainder of its vomer, of which I have the half; with numerous other parts of the cranium added since the description of the species, it was dug out by my energetic friend Jas. T. Thomas, whose evidence as to the pertinence of the various pieces described to the same animal is conclusive. It is, if need be, confirmed by the white color and porous texture of them all, a character not noticeable in other large whale remains procured by him. Apparently pertaining to a genus known as fossil only from the European drift, it becomes important to be sure of its Miocene origin. This must be admitted; it lay together as originally deposited, just below the upper shell line, and did not extend so far down as the great bed, from 10 to 18 feet below the top of the blue loam. The upper line of the latter has been varied, inland, by the various operations of erosion, etc. In some places it forms the bottom of vallies, which are excavated almost to the shell line. In such a situation, about  $3\frac{1}{2}$  feet above the great shell bed, and a few inches below the surface on the side of a creek, the bones of *Galera* and *Dicotyles* occurred.

***BASILOSA URIDÆ.***

CETOPHIS Cope.

This genus rests upon the evidence furnished by caudal vertebræ in the collection. They present an approximation to *Basilosaurus* in the great thickness of their epiphyses. In the more elongate vertebra each epiphysis will measure the third the length of the centrum deprived of them; in the less elongate, they measure one-half the same; in the shortest, more than half the

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